

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

1-42. (Cancelled)

43. (Currently Amended): An isolated DNA sequence encoding a polypeptide having the ~~biological activity~~ enzymatic activity of amorpha-4,11-diene synthase, wherein the DNA sequence exhibits at least 70% homology to SEQ ID NO: 13 or the complementary strand thereof.

44. (Cancelled).

45. (Currently Amended): The DNA sequence as claimed in claim ~~44~~43, which is at least 80% homologous to ~~the sequence in Fig. 12~~SEQ ID NO: 13.

46. (Currently Amended): The DNA sequence as claimed in claim 43, which has the sequence ~~as shown in Fig. 12~~of SEQ ID NO: 13.

47. (Previously Presented): The DNA sequence as claimed in claim 43, wherein the sequence has been isolated from plants producing amorpha-4,11-diene.

48. (Previously Presented): A method for producing amorphadiene synthase, comprising transforming or transfecting a host cell with the DNA sequence claimed in claim 43.

49. (Previously Presented): A DNA construct comprising the DNA sequence as claimed in claim 43 operably linked to suitable transcription initiation and termination sequences.

50. (Previously Presented): A host cell comprising a DNA sequence as claimed in claim 43.

51. (Previously Presented): The host cell as claimed in claim 50, wherein the cell is a bacterial cell.

52. (Previously Presented): The host cell as claimed in claim 50, wherein the cell is a plant cell.

53. (Previously Presented): The host cell as claimed in claim 52, wherein the cell is derived from a plant itself producing sesquiterpenes.

54. (Previously Presented): The host cell as claimed in claim 50, wherein the cell is a cell selected from the group consisting of *A. annua*, *V. oblongifolia* and *E. coli*.

55. (Previously Presented): The host cell as claimed in claim 53, wherein the cell is derived from a plant selected from the group consisting of the genera *Carum*, *Cichorium*, *Daucus*, *Juniperus*, *Chamomilla*, *Lactuca*, *Pogostemon* and *Vetiveria*.

56. (Currently Amended): The host cell as claimed in claim 52, wherein the cell is derived from a plant, and wherein~~in which~~ the biosynthesis of sesquiterpenoids can be ~~induced by elicitation~~elicited.

57. (Previously Presented): The host cell as claimed in claim 56, wherein the cell is derived from a plant selected from the group consisting of the genera *Capsicum*, *Gossypium*, *Lycopersicon*, *Nicotiana*, *Phleum*, *Solanum* and *Ulmus*.

58. (Previously Presented): The host cell as claimed in claim 52, wherein the cell is derived from a plant selected from the group consisting of soybean, sunflower and rapeseed.

59. (Previously Presented): The host cell as claimed in claim 50, wherein the cell is a yeast cell.

60. (Previously Presented): The host cell as claimed in claim 59, wherein the yeast cell is a cell selected from the group consisting of *Saccharomyces cerevisiae* and *Pichia pastoris*.

61. (Previously Presented): The host cell as claimed in claim 59, wherein the cell is an oleaginous yeast cell.

62. (Previously Presented): The host cell as claimed in claim 61, wherein the oleaginous yeast cell is a *Yarrowia lipolytica* cell.

63. (Previously Presented): The host cell as claimed in claim 50, which cell is part of a tissue or organism.

64. (Previously Presented): A transgenic tissue, consisting at least part of host cells as claimed in claim 50.

65. (Previously Presented): A transgenic organism, consisting at least part of host cells as claimed in claim 50.

66-68. (Cancelled).

69. (Previously Presented): A method of preparing amorphaadiene, comprising the steps of:

- a) transfecting or transforming a suitable host cell with a DNA sequence as claimed in claim 43 to obtain transgenic host cells;
- b) expressing the said DNA sequence in the presence of farnesyl pyrophosphate (FPP) to form amorphaadiene; and

c) isolating the amorphadiene thus formed,

wherein the expression level of the amorphadiene synthase is higher in transgenic host cells, tissues or organisms harboring an endogenous version of the DNA sequence than in non-transgenic host cells, tissues or organisms.

70. (Cancelled).

71. (Previously Presented): A method of preparing artemisinin, comprising:

a) transfecting or transforming a suitable host cell, tissue or organism with a DNA sequence as claimed in claim 43 to obtain transgenic host cells, tissues or organisms;

b) expressing the said DNA sequence in the presence of farnesyl pyrophosphate (FPP); and

c) isolating the amorpha-4,11-diene thus formed,

wherein the transgenic host cells, tissues or organisms harbor the genetic information coding for the enzymes that further convert amorpha-4,11-diene to artemisinin and wherein the expression level of the amorpha-4,11-diene synthase is higher in transgenic host cells, tissues or organisms harboring an endogenous version of the DNA sequence than in non-transgenic host cells, tissues or organisms.

72. (Previously Presented): A source of artemisinin, comprising host cells, tissues or organisms harboring a DNA sequence as claimed in claim 43 and the genetic information coding for the enzymes that further convert amorpha-4,11-diene to artemisinin, which host cells, tissues or organisms have expressed the said DNA sequence.

73. (Previously Presented): The source as claimed in claim 72, wherein the cells are cells selected from the group consisting of bacterial cells, yeast cells or plant cells.

74. (Previously Presented): The source as claimed in claim 72, wherein the cells are disrupted.

75. (Previously Presented): A transgenic cell, tissue or organism harboring in its genome more copies of a DNA sequence as claimed in claim 43 than are present in a corresponding non-transgenic cell, tissue or organism.

76. (Previously Presented): The transgenic cell as claimed in claim 75, which cell is an *E. coli* cell.

77. (Previously Presented): The transgenic cell as claimed in claim 75, which cell is a *Saccharomyces cerevisiae* cell.

78. (Previously Presented): The transgenic cell as claimed in claim 75, which cell is a *Yarrowia lipolytica* cell.

79. (Previously Presented): The transgenic organism as claimed in claim 75, wherein the organism is a plant itself producing sesquiterpenes.

80. (Previously Presented): The transgenic organism as claimed in claim 79, wherein the organism is an organism selected from the group consisting of *A. annua* and *V. oblongifolia*.

81. (Previously Presented): The transgenic organism as claimed in claim 79, wherein the organism is a plant selected from the group consisting of the genera *Carum*, *Cichorium*, *Daucus*, *Juniperus*, *Chamomilla*, *Lactuca*, *Pogostemon* and *Vetiveria*.

82. (Previously Presented): The transgenic organism as claimed in claim 75, wherein the organism is a plant in which the biosynthesis of sesquiterpenoids can be induced by elicitation.

83. (Previously Presented): The transgenic organism as claimed in claim 82, wherein the organism is a plant selected from the group consisting of the genera *Capsicum*, *Gossypium*, *Lycopersicon*, *Nicotiana*, *Phleum*, *Solanum* and *Ulmus*.

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84. (Previously Presented): The transgenic organism as claimed in claim 75, wherein the organism is a plant selected from the group consisting of soybean, sunflower and rapeseed.

85. (Currently Amended): The DNA sequence as claimed in claim 44, which is at least 90% homologous to ~~the sequence in Fig. 12~~SEQ ID NO: 13.

86. (Currently Amended): The DNA sequence as claimed in claim 44, which is at least 95% homologous to ~~the sequence in Fig. 12~~SEQ ID NO: 13.